

LXVII.—On the Morphological Significance of the Joints of the Mandibles in the Acari. By Dr. A. C. OUDEMANS*.

IN the legs of the Acari the following joints are generally distinctly recognizable:—coxa, trochanter, femur, genu (patella), tibia, and tarsus. Sometimes two or more of these joints are fused together; thus in the case of certain species we meet with a trochanterofemur or a femorogenu. It may also happen that a joint is divided into two or more small joints. Thus, for instance, the femur may be divided into a basifemur and a telofemur, or in a tarsus a basitarsus, a mesotarsus, and a telotarsus may clearly be distinguished.

If we now compare the maxillæ of the Parasitilæ (Gamasidæ) with the legs in the same family, we arrive at the conclusion that the coxæ of the two maxillæ have become fused into a hypostoma, and that the rest of the joints have remained freely movable and form the palpi, in which we can recognize distinctly trochanter, femur, genu, tibia, and tarsus. The tarsus is, however, not attached to the tibia exactly at its distal extremity, but obliquely on its under and inner side. The tarsus itself bears beneath on the inner side and proximally a much deformed hair, which is capable of being moved by muscles (a three-pronged fork without a handle).

On examining a mandible we find that it is generally composed of three joints, namely, (1) a cylindrical joint, (2) a likewise cylindrical joint, which is movably united to the first joint by means of two lateral condyles and narrows abruptly at its distal extremity. At the proximal end of this narrowed portion there lies on the ventral side a slit or pit, in which the third joint is movably wedged, almost in the same way as that in which one of the rami of our lower jaw is attached to the temporal bone, that is by means of a posterior and upper condyle. The third joint and the attenuated distal portion of the second together form the *chela*, with a *digitus fixus* above and a *digitus mobilis* below.

In many families or orders the mandible consists, however, of only two joints—namely, of those described above, the first and second are fused together, and then constitute a somewhat differently shaped, more powerful, and more or less pyriform structure, the head of which is situated proximally, while the stalk represents distally the *digitus fixus*.

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It is self-evident that it will be a difficult task to compare with a leg an appendage so entirely transformed. The attempts in this direction which have been undertaken in various ways by myself and other investigators must be regarded as having failed, yet I think that I am now able to compare and name the joints of the mandibles correctly.

I made a preparation of a mandible of an *Uropoda africana*, Oudms. This was composed of all known joints. It exhibited a trapezoidal coxa, a short trochanter, and a longer femur, which is united by means of two lateral condyles with a still longer genu; the latter, again, is connected by a dorsal condyle with the tibia, which carries the tarsus proximally in a pit on its ventral surface!

In the Parasitidæ, therefore, the proximal cylindrical joint is formed of the united coxa, trochanter, and femur, and the second joint of the united genu and tibia, while the last joint, the digitus mobilis of the chela, represents the tarsus. I go still further, and see in the ventral, proximal, and internal copulatory organ of the male Parasitidæ an analogue of the above-described furcate hair of the tarsus palparum.

In cases in which the mandible consists of only two joints (*e. g.* in the Labidostomidæ, Bdellidæ, Oribatidæ, and Acaridæ) the first joint is consequently to be regarded as a fusion of the coxa, trochanter, femur, genu, and tibia, while the digitus mobilis represents merely the tarsus.

BIBLIOGRAPHICAL NOTICE.

Darwinism and the Problems of Life. By CONRAD GUENTHER, Ph.D., Professor at the University of Freiburg in Baden. Translated from the Third Edition by JOSEPH McCABE. London: A. Owen & Co., 1906.

THE author tells us that "the present work had its origin in an attempt to appreciate the range, the foundation, and the value of evolutionary theories." This attempt accomplished, to his own satisfaction, he expresses a desire so to present the facts that he has garnered as to enable "nature herself . . . [to] teach the reader the truth of evolution."

But we venture to think that the author has by no means attained his ambition. His presentation of Darwinism is laboured, amateurish, and occasionally grotesque!

The translator is obviously not a zoologist, and to him probably